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# Limnogeology: tales of an evolving Earth

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isotopic ratios and calcite morphology.

Geochemical features of the sediments are as follows: 1) in beige gyttja carbonate and organic matter contents amount to 16.5 % and 17.3 %, respectively; on the contrary, black gyttja is enriched in organic matter averaging 26.4 % and carbonate concentration is as low as 10.3 %

2) the only carbonate mineral is low-Mg calcite occurring in the form of micrite and microspar

3) all carbonate samples reveal low values of Mg/Ca and Fe/Mn ratios

4) beige and black gyttjas display substantial differences in calcite morphology  $\square$  in the former small sub-hedral crystals predominate, while in the latter larger elongated and euhedral forms developed

5) carbonates from black and beige gyttjas display similar patterns of  $\delta^{13}\text{C}$  and  $\delta^{18}\text{O}$  variation; the former ranges from -1.87 ‰ to +0.04 ‰ and the latter from -9.17 ‰ to -4.86 ‰; it is worth noticing, that between  $\delta^{13}\text{C}$  and  $\delta^{18}\text{O}$  strong positive relationship exists

Results outlined above unambiguously indicate that  $\text{CaCO}_3$  in both facies precipitated in freshwater and well oxygenated conditions, but the effect of enhanced biological productivity and methanogenesis can not be ruled out. The latter is especially supported by positive values of  $\delta^{13}\text{C}$ .

On the other hand, the problem of coexistence of  $\text{CaCO}_3$  and FeS in the samples with low Fe/Mn ratio, remains still unclear.

### WED-P14

#### Trace metals, TOC, Ostracoda and sedimentology of the *Congeria subglobosa* horizon from Lake Pannon

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Upper Miocene *Congeria subglobosa* horizon with shells in autochthonous position was investigated sedimentological, paleontological, and geochemical methods at locality Gbely (Vienna Basin) to attest its anoxic/hypoxic origine. 40 samples were naturally dried and successively 150 grams of sediment were

washed with a 0.09 mm mesh net to obtain the microfossils. 10 g of each sample were homogenised and analysed by AAS method as a bulk for Pb, Cd, Cr, Cu, Co, Ni and TOC.

#### Results

Sand, silt and calcareous light clay (0.0-1.0m) pass to weakly calcareous gray-brown and non-calcareous grayish blue homogenous clay (1.7-2.3m) barren of fossils. Trace metal and TOC (0-0.43%) content of this basal sequence is low and strongly depending on lithology.

This sequence is overlaid by thin sandy horizon with disarticulated *Unio* shell. Above *Unio* horizon, a significant increase in TOC content (0.71-1.35%) is identified in calcareous and laminated silt (2.8-6.3 m) with parallel and subparallel lamination and current ripples in the middle part of body. Two sub-horizons of disarticulated *Limnocardium* shells are situated at top of this sequence. Slight increase in Cr (109-144 ppm), Ni (50-66 ppm), Cu (20-27 ppm), and Pb (17-29 ppm) content is registered only in *Limnocardium* sub-horizons and it follows TOC curve and increase of preserved ostracod valves of *Cyprideis*, *Amplocypris*, and *Candoninae*.

The overlaid homogeneous blue and brown non-calcareous clay and silty clay of the offshore region (6.3-8.8m) rarely contain small *Limnocardium* fragments and ostracods, representing mainly by *Amplocypris*. An increased in concentration of Cr (129-161 ppm), Ni (62-69 ppm), Co (16-18 ppm), and Pb (24-29 ppm) is observed. TOC (0.67-1.05%) and Cu (24-27 ppm) content is still high and identical to *Limnocardium* sub-horizons.

A concentration of Ni (53-62 ppm), Co (14-22 ppm), Cu (18-32 ppm) and TOC (0.15-0.63 %) decreases in *Congeria subglobosa* horizon (8.8-10.0m). In contrary, a quantity of the preserved ostracod valves and ostracod genera increase. The brackish *Cyprideis*, *Loxoconcha*, endemic *Amplocypris*, *Cyprina*, *Hemicytheria*, and Lake Pannon *Candoninae* were found in the deposits. This trend continues (TOC 0.0-0.65%, Ni 47-55 ppm, Co 13-15 ppm, Cr 115-126 ppm, Cu 17-20 ppm) in superimposed strongly bioturbated silt with well-developed burrows (10.5-12.0m).

#### Conclusion

*Congeria subglobosa* horizon is rich on benthic ostracods, which generally occupy all water environment except anoxic milieu. In contrary to offshore clay barren of fossils, it shows lower concentration in TOC and trace metals.

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### WED-P15 Geomorphology in the

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